REMARKS

Claims 1, 3-6, 8 and 9 were pending in the present application. By virtue of this response, claims 1, 3, 5, and 8 have been amended, claims 4 and 9 have been cancelled and new claims 10 and 11 have been added. Accordingly, claims 1, 3, 5, 6, 8, 10 and 11 are currently under consideration. Amendment and cancellation of certain claims is not to be construed as a dedication to the public of any of the subject matter of the claims as previously presented. No new matter has been added. (Claim 2 was cancelled in the Amendment filed after final rejection on June 2, 2003, which was requested to be entered upon filing of the RCE on July 25, 2003.)

Rejections under 35 U.S.C. 103(a)

Claims 1-6 and 8-9 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Ogawa et al. (6,455,877), in view of Goetz et al. (6,441,393) and Yuasa et al. (6,518,602). It is respectfully submitted that the combination of Ogawa and Goetz both fails to yield or suggest the claimed invention. (For the purpose of the present response, Applicant does not take a position on whether Ogawa and Goetz are properly combined.)

We refer the Examiner to the background portion of the specification at, for example, lines 7-32 of page 2. There, it is discussed that, in the case of fabricating a nitride-based semiconductor light-emitting device with a GaN substrate formed by a conventional HVPE method, N or/and Ga are likely to escape out of the substrate interface, causing increase of defect density. The increase of defect density increases the threshold current and shortens the lifetime of the device.

As discussed in the detailed description portion of the specification at, for example, lines 23-30 of page 5, crystal integrity and conductivity of the substrate are improved by adding O atoms in addition to dopant Si, to control n-type conductivity of the substrate. The semiconductor stacked-layer structure formed by MOCVD on the improved substrate has decreased defect density. Thus, the device characteristics are improved.

Although the Ogawa reference discloses that Si and O can be used as an n-type dopant for a GaN substrate, the Ogawa reference does not disclose to add both Si and O into a GaN substrate formed by an HVPE method. Ogawa does not disclose that the surface of the HVPE substrate can be improved by addition of O atoms but, rather, only lists O as one example of n-type dopants. In the substrate of the claimed LED, on the other hand, O atoms are added in addition to dopant Si, thus controlling n-type conductivity to improve crystal integrity of the substrate surface and the layer formed thereon by MOCVD.

The Geotz reference is also deficient. Although the Goetz reference discloses that cracks in a layer formed on a substrate can be decreased by doping the layer with a combination of Si, Ge, Sn, or O, it is not disclosed to dope a substrate (let alone an interface region of a substrate) with both Si and O so as to improve crystal integrity of a semiconductor stacked-layer structure formed on a surface of the substrate by HVPE. Therefore, Goetz does not make obvious the present invention that improves the surface of the substrate formed by HVPE.

The Yuasa reference does not disclose to dope the substrate with O atoms either. In addition, it appears that the Yuasa reference is not prior art to the present patent application. In particular, under 35 USC 103(c) provides a carveout of certain prior art from use in an obviousness rejection. In particular, where the alleged prior art subject matter qualifies as prior art only under one or more subsections (e), (f) and (g) of section 102, and the alleged prior art subject matter and the claimed invention are commonly owned at the time the invention was made, then the alleged prior art subject matter does not qualify as prior art that can be used in making an obviousness rejection.

Here, the Examiner has not indicated under which section of 102 the Yuasa reference is considered to qualify as prior art. However, it appears that only section 102(e) is a candidate, if it is assumed that the presumptive "invention date" is the filing date of the corresponding Japanese priority patent application -- January 31, 2001. This is given that the US filing date of the Yuasa reference is earlier -- September 1, 2000 -- and ignores the possibility of the present applicant swearing behind the Yuasa reference. However, swearing behind is not necessary given that, as

discussed above, section 103(c) would bar this section 102(e) reference from being used in making the obviousness rejection advanced by the Examiner.

The rebuttal of the obviousness rejection is similarly applicable to both independent claims 1 and 5, recognizing that claim 5 does not recite a silicon-doped substrate but does recite a substrate including a p-type impurity.

In summary, then, none of the cited references disclose or suggest that a layer formed by MOCVD on the GaN-based substrate can be improved by adding O atoms at least in the interface region of the substrate formed by HVPE. For at least this reason, the combination of references does not yield the claimed invention. In addition, it appears that one of the cited references -- the Yuasa reference -- is not properly cited in any event for use in an obviousness rejection and, therefore, the obviousness rejection is *prima facie* improper.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 245402004200. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

By_____

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